20 mm depth on said aqueous ammonia solution to improve bead shape.

REMARKS

Reconsideration and allowance of the application are respectfully requested in light of the amendments to the claims and the remarks which follow.

Upon entry of the amendment, the claims before the Examiner are claims 12 and 15-18. Claim 16 corresponds to subject matter allowed in the corresponding European patent application. Claim 16 includes as additional limitations those of claims 13 and 14, respectively. Claims 17 and 18 correspond to cancelled claims 10 and 11, respectively, with some minor editorial changes to render them more consistent with the Jepson claim format employed. Support for the newly added claims generally exists in the originally present claims and pages 5 *et seq*. of the specification.

Claims 9-13 and 15 are rejected under 35 U.S.C. § 103 as being unpatentable over Bezzi et al. '200. Claims 9-13 and 15 are rejected under 35 U.S.C. § 103 as being unpatentable over Bezzi et al. '200 as applied to claims 9-13 and 15 above, and further in view of Takumi et al. and Sanchez et al. Claims 9-15 are rejected under 35 U.S.C. § 103 as being unpatentable over

Bezzi et al. '200 taken alone or with Takumi et al. or Sanchez et al. as applied to claims 9-13 and 15 above, and further in view of Landis or DeHaven et al.

Applicants respectfully traverse the three rejections for the reasons which follow.

Applicants' process produces aluminum oxide beads with optimum spherical shape and narrow grain spectrum, in conjunction with suitable porosity and high breaking strength plus low abrasion loss.

These beads are economically produced using the claimed process which employs high throughput rates and optimal reaction conditions for producing the desired spherical aluminum oxide beads. Numerous prior art failures to solve the problems solved by Applicants are reported in the "background" section of the specification.

At the heart of the rejections is the Bezzi et al. '200 reference and its subsequent combination with Takumi, Sanchez et al., Landis and DeHaven et al. There is no suggestion or mention of aluminum oxide within Bezzi et al. There is no suggestion within Bezzi et al. to combine it with the named secondary references to arrive at the claimed process nor is there a recognition of the problems solved by Applicants or the benefits achieved by the claimed process. It appears that the Examiner has merely assembled the references in light of

Applicants' specification. The Examiner in short has not established a *prima facie* case of obviousness.

Additionally, from Applicants' point of view, the Examiner's opinion that the prior art -- especially Bezzi -- contains hints in direction of the invention is not factually supported. It must be pointed out that Bezzi does not refer to the manufacture of aluminum oxide beads. A starting solution is formed into droplets with a vibrating plate. The droplets are contacted with reactive gas. However, while the reactive gas flows to and contacts the droplets, this contact occurs only on one side. This results in insufficient pre-solidification by the gas flow since the side of the droplets which is turned away from the gas is not pre-solidified sufficiently to prevent a deformation of the droplets when they fall into a liquid. This deformation cannot be avoided by formation of a foam layer on the surface of the liquid.

Accordingly, even if it were obvious to employ aluminum oxide in the Bezzi process, the resulting aluminum oxide element would <u>not</u> have an optimum spherical bead shape and narrow grain spectrum, in conjunction with suitable porosity and high breaking strength plus low abrasion loss.

Further, according to the claims, it is not only required that the initial liquid have the specified viscosity and be formed as droplets at the specified frequency, but also the

droplets are formed in the presence of a ring nozzle and are blown with ammonia gas from the interior and the exterior of the nozzle arrangement.

These reaction conditions cause the droplets to solidify evenly. This arrangement ensures that the entering ammonia gas does not cause a deformation of the droplets due to unevenness of gas contact. This arrangement also permits high throughput rates. The prior art cited by the Office does not suggest these conditions or the economical high throughput rates.

The differences between the invention and Bezzi have been sufficiently discussed. These deficiencies are not remedies by the secondary references.

In contrast to Takumi, the Applicants provide a method to manufacture aluminum oxide beads at room temperature. According to Takumi, droplets are put in an oil bath. This is necessary because the initial solution contains a gelling agent which hydrolyses only at an elevated temperature. Takumi further does not suggest the formation of droplets from an initial liquid by a ring nozzle and the pre-solidification of the droplets by surrounding them with an ammonia gas flow.

Landis provides a method of prilling which is not relevant to the claimed process. Further, there is no hint within the reference to blow droplets falling within a hollow cylinder casing with ammonia gas directed from a nozzle ring

arrangement having interior and exterior nozzles in a controlled manner.

DeHaven teaches a method for producing droplets from a melt. While physical pre-solidification and drop formation involves the formation of droplets from a melt using a vibrating plate, the other features which characterize the claimed invention are not mentioned at all, as for example the blowing with an ammonia gas.

Since a *prima facie* case of obviousness has not been factually established for the reasons set forth above, the Examiner is respectfully requested to withdraw the rejections.

Having addressed the outstanding rejections, allowance of the claims and a Notice to that effect are respectfully requested.

Respectfully submitted,

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